

Application Serial Number 09/760,924

IN THE CLAIMS

1 Claim 1. (currently amended): Apparatus for use in a video image de-interlacer
2 comprising:
3 a frame interpolator for yielding a frame based luminance value for a missing
4 pixel by using frame based interpolation;
5 a field interpolator for yielding a field based luminance value for a missing pixel
6 by using field based interpolation;
7 a luminance difference unit for obtaining luminance value differences of pixels in
8 prescribed fields of an image in accordance with prescribed criteria;
9 a motion detector supplied with prescribed ones of said luminance value
10 differences for generating a motion metric value at a missing pixel and for filtering said
11 pixel differences to remove aliases under predetermined motion conditions;
12 a spatial median filter supplied with at least three of said motion metric values for
13 determining a median motion metric value and for removing random noise from said
14 luminance differences without creating spurious motion values; and
15 a controllable combiner supplied with said frame based luminance value and said
16 field based luminance value and being responsive to a representation of said median
17 motion metric value to controllably supply as an output a luminance value for said
18 missing pixel,
19 wherein said controllable combiner, in response to said representation of said
20 median motion metric value indicating the image is still, outputs said frame based
21 luminance value and, in response to said representation of said median motion metric
22 value indicating motion in the image, outputs said field based luminance value.

1 Claim 2. (original:) The apparatus as defined in claim 1 wherein said spatial
2 median filter is a nine-value spatial median filter.

 Claim 3. (Cancel).

1 Claim 4. (original:) The apparatus as defined in claim 3 wherein said frame based
2 luminance value is generated by said frame interpolator in accordance with $C_0 = C_{-1}$,
3 where C_0 is the luminance value of the missing pixel in field f_0 and C_{-1} is the
4 luminance value of a pixel corresponding to the missing pixel in a last prior field f_{-1} .

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5 relative to field f_0 , and said field based luminance value is generated by said field
6 interpolator in accordance with $C_0 = \frac{(N_0 + S_0)}{2}$, where N_0 is the luminance value of a
7 pixel above of and in the same field f_0 as the missing pixel, and S_0 is the luminance
8 value of a pixel below of and in the same field f_0 as the missing pixel.

1 Claim 5. (original:) The apparatus as defined in claim 1 wherein said luminance
2 difference unit generates a plurality of prescribed luminance value differences of pixels
3 in prescribed fields of the image, and said motion detector employs prescribed
4 relationships of said luminance value differences to generate said motion metric value.

1 Claim 6. (original:) The apparatus as defined in claim 5 wherein said luminance
2 difference unit generates a first luminance difference value in accordance with
3 $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing
4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , and generates
6 at least a second luminance difference value in accordance with
7 $\Delta_s = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the
8 same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the
9 same field f_0 as the missing pixel, N_{-2} is a luminance value of a pixel above of the
10 missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
11 missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in
12 the second prior field f_{-2} relative to the field f_0 including the missing pixel.

1 Claim 7. (original:) The apparatus as defined in claim 6 wherein said motion
2 detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_s)$, where
3 Δ is said motion metric value.

1 Claim 8. (original:) The apparatus as defined in claim 5 wherein said luminance
2 difference unit generates a first luminance difference value in accordance with
3 $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing

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4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , generates a
6 second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a
7 luminance value of a pixel above of and in the same field f_0 as the missing pixel and
8 N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior
9 field f_{-2} relative to the field f_0 including the missing pixel, and generates at least a third
10 luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance
11 value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a
12 luminance value of a pixel below of the missing pixel and in the second prior field f_{-2}
13 relative to the field f_0 including the missing pixel.

1 Claim 9. (original:) The apparatus as defined in claim 8 wherein said motion
2 detector generates said motion metric value in accordance with
3 $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

1 Claim 10. (original:) The apparatus as defined in claim 1 further including a
2 look-up table including blending factor values related to said median motion metric
3 values and being responsive to said median motion metric value from said spatial median
4 filter for supplying as an output a corresponding blending factor value as said
5 representation of said median motion metric value.

1 Claim 11. (original:) The apparatus as defined in claim 10 wherein said
2 controllable combiner is responsive to said blending factor for supplying as an output a
3 luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1 - \alpha)C_{-1}$,
4 where C_0 is the luminance value of the missing pixel in field f_0 , C_{-1} is the luminance
5 value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field
6 f_0 , N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing
7 pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the
8 missing pixel and α is the blending factor.

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1 Claim 12. (original:) The apparatus as defined in claim 11 wherein said luminance
2 difference unit generates a plurality of prescribed luminance value differences of pixels
3 in prescribed fields of the image, and said motion detector employs prescribed
4 relationships of said luminance value differences to generate said motion metric value.

1 Claim 13. (original:) The apparatus as defined in claim 12 wherein said luminance
2 difference unit generates a first luminance difference value in accordance with
3 $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing
4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , and generates
6 at least a second luminance difference value in accordance with

7 $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the
8 same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the
9 same field f_0 as the missing pixel, N_{-2} is a luminance value of a pixel above of the
10 missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
11 missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in
12 the second prior field f_{-2} relative to the field f_0 including the missing pixel.

1 Claim 14. (original:) The apparatus as defined in claim 13 wherein said motion
2 detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_a)$, where
3 Δ is said motion metric value.

1 Claim 15. (original:) The apparatus as defined in claim 10 wherein said
2 luminance difference unit generates a first luminance difference value in accordance with
3 $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing
4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , generates a
6 second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a
7 luminance value of a pixel above of and in the same field f_0 as the missing pixel and
8 N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior

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9 field f_{-2} relative to the field f_0 including the missing pixel, and generates at least a third
10 luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance
11 value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a
12 luminance value of a pixel below of the missing pixel and in the second prior field f_{-2}
13 relative to the field f_0 including the missing pixel.

1 Claim 16. (original:) The apparatus as defined in claim 15 wherein said motion
2 detector generates said motion metric value in accordance with
3 $\Delta = \max(\Delta_s, \min(\Delta_r, \Delta_t))$, where Δ is said motion metric value.

1 Claim 17. (currently amended) Apparatus for use in a video image de-interlacer
2 comprising:

3 a frame interpolator for yielding a frame based luminance value for a missing
4 pixel by using frame based interpolation;

5 a field interpolator for yielding a field based luminance value for a missing pixel
6 by using field based interpolation;

7 a luminance difference unit for obtaining luminance value differences of pixels in
8 prescribed fields of an image in accordance with prescribed criteria;

9 a motion detector supplied with prescribed ones of said luminance value
10 differences for generating a motion metric value at a missing pixel and for filtering said
11 pixel differences to remove aliases under predetermined motion conditions;

12 a look-up table including blending factor values related to said motion metric
13 values and being responsive to supplied motion metric values for supplying as an output
14 corresponding blending factor values;

15 a spatial median filter supplied with at least three of said blending factor values
16 for determining a median motion metric value and for removing random noise from said
17 luminance differences without creating spurious motion values; and

18 a controllable combiner supplied with said frame based luminance value and said
19 field based luminance value and being responsive to a said median blending factor value
20 to controllably supply as an output a luminance value for said missing pixel,

21 wherein said controllable combiner, in response to said representation of said
22 median motion metric value indicating the image is still, outputs said frame based

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23 luminance value and, in response to said representation of said median motion metric
 24 value indicating motion in the image, outputs said field based luminance value.

1 Claim 18. (original:) The apparatus as defined in claim 17 wherein said spatial
 2 median filter is a nine-value spatial median filter.

Claim 19. (cancel:).

1 Claim 20. (original:) The apparatus as defined in claim 17 wherein said
 2 controllable combiner is responsive to said blending factor for supplying as an output a
 3 luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1 - \alpha)C_{-1}$,
 4 where C_0 is the luminance value of the missing pixel in field f_0 , C_{-1} is the luminance
 5 value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field
 6 f_0 , N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing
 7 pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the
 8 missing pixel and α is the blending factor.

1 Claim 21. (original:) The apparatus as defined in claim 20 wherein said
 2 luminance difference unit generates a plurality of prescribed luminance value differences
 3 of pixels in prescribed fields of the image, and said motion detector employs prescribed
 4 relationships of said luminance value differences to generate said motion metric value.

1 Claim 22. (original:) The apparatus as defined in claim 21 wherein said
 2 luminance difference unit generates a first luminance difference value in accordance with
 3 $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing
 4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
 5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , and generates
 6 at least a second luminance difference value in accordance with
 7 $\Delta_a = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a pixel above of and in the
 8 same field f_0 as the missing pixel, S_0 is a luminance value of a pixel below of and in the
 9 same field f_0 as the missing pixel, N_{-2} is a luminance value of a pixel above of the
 10 missing pixel and in the second prior field f_{-2} relative to the field f_0 including the

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11 missing pixel and S_{-2} is a luminance value of a pixel below of the missing pixel, and in
12 the second prior field f_{-2} relative to the field f_0 including the missing pixel.

1 Claim 23. (original:) The apparatus as defined in claim 22 wherein said motion
2 detector generates said motion metric value in accordance with $\Delta = \max(\Delta_c, \Delta_o)$, where
3 Δ is said motion metric value.

1 Claim 24. (original:) The apparatus as defined in claim 21 wherein said
2 luminance difference unit generates a first luminance difference value in accordance with
3 $\Delta_o = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to the missing
4 pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel and C_1 is
5 a luminance value of a pixel corresponding to the missing pixel in field f_1 , generates a
6 second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a
7 luminance value of a pixel above of and in the same field f_0 as the missing pixel and
8 N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior
9 field f_{-2} relative to the field f_0 including the missing pixel, and generates at least a third
10 luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance
11 value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a
12 luminance value of a pixel below of the missing pixel and in the second prior field f_{-2}
13 relative to the field f_0 including the missing pixel.

1 Claim 25. (original:) The apparatus as defined in claim 24 wherein said motion
2 detector generates said motion metric value in accordance with
3 $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

1 Claim 26. (currently amended:) A method for use in a video image de-interlacer
2 comprising the steps of:

3 frame interpolating to yield a frame based luminance value for a missing pixel by
4 using frame based interpolation;

5 field interpolating to yield a field based luminance value for a missing pixel by
6 using field based interpolation;

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7 obtaining luminance value differences of pixels in prescribed fields of an image in
8 accordance with prescribed criteria;

9 filtering said pixel luminance value differences to remove aliases under
10 predetermined motion conditions;

11 in response to prescribed ones of said luminance value differences, generating a
12 motion metric value at a missing pixel;

13 spatial median filtering at least three of said motion metric values to determine a
14 median motion metric value and to remove random noise from said luminance
15 differences without creating spurious motion values; and

16 controllably combining said frame based luminance value and said field based
17 luminance value and in response to a representation of said median motion metric value
18 controllably supplying as an output a luminance value for said missing pixel,

19 wherein said step of controllably combining, in response to said representation of
20 said median motion metric value indicating the image is still, outputs said frame based
21 luminance value and, in response to said representation of said median motion metric
22 value indicating motion in the image, outputs said field based luminance value.

1 Claim 27. (original:) The method as defined in claim 26 wherein said step of
2 spatial median filtering employs a nine-value spatial median filter.

Claim 28. (cancel:).

1 Claim 29. (original:) The method as defined in claim 28 wherein said step of
2 frame interpolating includes a step of generating said frame based luminance value in
3 accordance with $C_0 = C_{-1}$, where C_0 is the luminance value of the missing pixel in field
4 f_0 and C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last
5 prior field f_{-1} relative to field f_0 , and said step of field interpolating includes a step of
6 generating said field based luminance value in accordance with $C_0 = \frac{(N_0 + S_0)}{2}$, where
7 N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing
8 pixel, and S_0 is the luminance value of a pixel below of and in the same field f_0 as the
9 missing pixel.

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1 Claim 30. (original:) The method as defined in claim 26 wherein said step of
2 obtaining luminance value differences includes a step of generating a plurality of
3 generating a motion metric value includes a step of employing prescribed relationships of
4 said luminance value differences to generate said motion metric value.

1 Claim 31. (original:) The method as defined in claim 30 wherein said step of
2 obtaining luminance value differences includes a step of generating a first luminance
3 difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a
4 pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
6 missing pixel in field f_1 , and a step of generating at least a second luminance difference
7 value in accordance with $\Delta_s = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a
8 pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a
9 pixel below of and in the same field f_0 as the missing pixel, N_{-2} is a luminance value of
10 a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0
11 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing
12 pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing
13 pixel.

1 Claim 32. (original:) The method as defined in claim 31 wherein said step of
2 generating a motion metric value generates said motion metric value in accordance with
3 $\Delta = \max(\Delta_c, \Delta_s)$, where Δ is said motion metric value.

1 Claim 33. (original:) The method as defined in claim 30 wherein said step of
2 obtaining luminance value differences includes a step of generating a first luminance
3 value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel
4 corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
6 missing pixel in field f_1 , a step of generating a second luminance difference value in
7 accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and

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8 in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of
9 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
10 missing pixel, and a step of generating at least a third luminance difference value in
11 accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in
12 the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of
13 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
14 missing pixel.

1 Claim 34. (original:) The method as defined in claim 33 wherein said step of
2 generating a motion metric value includes a step of generating said motion metric value
3 in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

1 Claim 35. (original:) The method as defined in claim 26 further including a step
2 of employing a look-up table including blending factor values related to said median
3 motion metric values and, in response to a supplied median motion metric value,
4 supplying as an output a corresponding blending factor value as said representation of
5 said median motion metric value.

1 Claim 36. (original:) The method as defined in claim 35 wherein said step of
2 controllably combining, in response to said blending factor, supplying as an output a
3 luminance value for said missing pixel in accordance with $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1 - \alpha)C_{-1}$,
4 where C_0 is the luminance value of the missing pixel in field f_0 , C_{-1} is the luminance
5 value of a pixel corresponding to the missing pixel in a last prior field f_{-1} relative to field
6 f_0 , N_0 is the luminance value of a pixel above of and in the same field f_0 as the missing
7 pixel, S_0 is the luminance value of a pixel below of and in the same field f_0 as the
8 missing pixel and α is the blending factor.

1 Claim 37. (original:) The method as defined in claim 36 wherein said step of
2 obtaining luminance value differences includes a step of generating a plurality of
3 prescribed luminance value differences of pixels in prescribed fields of the image, and
4 said step of generating a motion metric value includes a step of employing prescribed
5 relationships of said luminance value differences to generate said motion metric value.

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1 Claim 38. (original:) The method as defined in claim 37 wherein said step of
 2 obtaining luminance values differences includes a step of generating a first luminance
 3 difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a
 4 pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
 5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
 6 missing pixel in field f_1 , and a step of generating at least a second luminance difference
 7 value in accordance with $\Delta_s = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a
 8 pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a
 9 pixel below of and in the same field f_0 as the missing pixel, N_{-2} is a luminance value of
 10 a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0
 11 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing
 12 pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing
 13 pixel.

1 Claim 39. (original:) The method as defined in claim 38 wherein said step of
 2 generating a motion metric value includes a step of generating said motion metric value
 3 in accordance with $\Delta = \max(\Delta_c, \Delta_s)$, where Δ is said motion metric value.

1 Claim 30. (original:) The method as defined in claim 35 wherein said step of
 2 obtaining luminance value differences includes a step of generating a first luminance
 3 difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a
 4 pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
 5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
 6 missing pixel in field f_1 , a step of generating a second luminance difference value in
 7 accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and
 8 in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of
 9 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
 10 missing pixel, and a step of generating at least a third luminance difference value in

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as related to the motion metric value as claim 1, as currently amended. Therefore, it is believed that claims 17, 26 and 42, as currently amended, are also allowable under 35 U.S.C. 103(a).

Claims 2, 4-16 are dependent from claim 1, as currently amended, and should be allowed for the same reasons as claim 1, as currently amended.

Claims 18, 20-25 are dependent from claim 17, as currently amended, and should be allowed for the same reasons as claims 1 and 17, as currently amended.

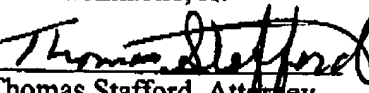
Claims 27, 28-41 are dependent from claim 26, as currently amended, and should be allowed for the same reasons as claims 1 and 26, as currently amended.

Claims 43, 45-50 are dependent from claim 1, as currently amended, and should be allowed for the same reasons as claims 1 and 44, as currently amended.

It is now believed that this application is in condition for allowance. Reconsideration and allowance are therefore respectfully solicited.

If there are still outstanding issues to be resolved, the Examiner is respectfully invited to call applicants' attorney, Thomas Stafford, at 727-772-4173 so that those issues may be discussed and satisfactorily resolved.

Respectfully,
Hong Jiang
Kim N. Matthews
Agesino Primactic, Jr.

By 
Thomas Stafford, Attorney
Registration No. 24767

Dated: 01/26/2005

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11 accordance with $\Delta_c = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in
12 the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of
13 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
14 missing pixel.

1 Claim 41. (original:) The method as defined in claim 40 wherein said step of
2 generating a motion metric value includes a step of generating said motion metric value
3 in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

1 Claim 42. (currently amended:) A method for use in a video image de-interlacer
2 comprising the steps of:

3 frame interpolating to yield a frame based luminance value for a missing pixel by
4 using frame based interpolation;

5 field interpolating to yield a field based luminance value for a missing pixel by
6 using field based interpolation;

7 obtaining luminance value differences of pixels in prescribed fields of an image in
8 accordance with prescribed criteria;

9 filtering said pixel luminance value differences to remove aliases under
10 predetermined motion conditions;

11 in response to prescribed ones of said luminance value differences, generating a
12 motion metric value at a missing pixel;

13 in response to supplied motion metric values, utilizing a look-up table including
14 blending factor values related to said motion metric values to supply as an output
15 corresponding blending factor values;

16 spatial median filtering at least three of said blending factor values for
17 determining a median blending factor value and to remove random noise from said
18 luminance differences without creating spurious motion values; and

19 controllably combining said frame based luminance value and said field based
20 luminance value and in response to said median blending factor value controllably
21 supplying as an output a luminance value for said missing pixel,

22 wherein said step of controllably combining includes a step, responsive to said
23 median blending factor value indicating the image is still, of outputting said frame based

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24 luminance value, and a step, responsive to said median blending factor value indicating
 25 motion in the image, of outputting said field based luminance value.

1 Claim 43. (original:) The method as defined in claim 42 wherein said spatial
 2 median filter is a nine-value spatial median filter.

Claim 44. (cancel:).

1 Claim 45. (original:) The method as defined in claim 42 wherein said step of
 2 combining includes a step, responsive to said median blending factor, of supplying as an
 3 output a luminance value for said missing pixel in accordance with
 4 $C_0 = \alpha \frac{(N_0 + S_0)}{2} + (1 - \alpha)C_{-1}$, where C_0 is the luminance value of the missing pixel in
 5 field f_0 , C_{-1} is the luminance value of a pixel corresponding to the missing pixel in a last
 6 prior field f_{-1} relative to field f_0 , N_0 is the luminance value of a pixel above of and in
 7 the same field f_0 as the missing pixel, S_0 is the luminance value of a pixel below of and
 8 in the same field f_0 as the missing pixel and α is the blending factor.

1 Claim 46. (original:) The method as defined in claim 45 wherein said step of
 2 obtaining luminance value differences includes a step of generating a plurality of
 3 prescribed luminance value differences of pixels in prescribed fields of the image, and
 4 said step of generating a motion metric value includes a step of employing prescribed
 5 relationships of said luminance value differences to generate said motion metric value.

1 Claim 47. (original:) The method as defined in claim 46 wherein said step of
 2 obtaining luminance value differences includes a step of generating a first luminance
 3 difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a
 4 pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
 5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
 6 missing pixel in field f_1 , and a step of generating at least a second luminance difference
 7 value in accordance with $\Delta_s = \left| \frac{N_0 + S_0}{2} - \frac{N_{-2} + S_{-2}}{2} \right|$, where N_0 is a luminance value of a
 8 pixel above of and in the same field f_0 as the missing pixel, S_0 is a luminance value of a
 9 pixel below of and in the same field f_0 as the missing pixel, N_{-2} is a luminance value of

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10 a pixel above of the missing pixel and in the second prior field f_{-2} relative to the field f_0
11 including the missing pixel and S_{-2} is a luminance value of a pixel below of the missing
12 pixel, and in the second prior field f_{-2} relative to the field f_0 including the missing
13 pixel.

1 Claim 48. (original:) The method as defined in claim 47 wherein said step of
2 generating a motion metric value includes a step of generating said motion metric value
3 in accordance with $\Delta = \max(\Delta_c, \Delta_s)$, where Δ is said motion metric value.

1 Claim 49. (original:) The method as defined in claim 46 wherein said step of
2 obtaining luminance value differences includes a step of generating a first luminance
3 difference value in accordance with $\Delta_c = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a
4 pixel corresponding to the missing pixel in the last prior field f_{-1} relative to a field f_0
5 including the missing pixel and C_1 is a luminance value of a pixel corresponding to the
6 missing pixel in field f_1 , a step of generating a second luminance difference value in
7 accordance with $\Delta_n = |N_0 - N_{-2}|$, where N_0 is a luminance value of a pixel above of and
8 in the same field f_0 as the missing pixel and N_{-2} is a luminance value of a pixel above of
9 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
10 missing pixel, and a step of generating at least a third luminance difference value in
11 accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance value of a pixel below of and in
12 the same field f_0 as the missing pixel and S_{-2} is a luminance value of a pixel below of
13 the missing pixel and in the second prior field f_{-2} relative to the field f_0 including the
14 missing pixel.

1 Claim 50. (original:) The method as defined in claim 49 wherein said step of
2 generating a motion metric value includes a step of generating said motion metric value
3 in accordance with $\Delta = \max(\Delta_c, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.